**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI**

**HYDERABAD CAMPUS**

**ACADEMIC – UNDERGRADUATE STUDIES DIVISION**

**SECOND SEMESTER 2022-2023**

**Course Handout (Part II)**

Date: 16/01/2023

In addition to Part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No. : PHA F413**

### Course Title : Pharmaceutical Management and Quality Control

**Instructor-in-charge : V. Vamsi Krishna Venuganti**

1. **Course description**: Concepts of Pharmaceutical management, managing of pharmaceutical industry, planning, layouts, designs, current good manufacturing practices, pharmaceutical process validation, documentation, pilot plant scale up technique optimization, pharmaceutical marketing, quality aspects and quality control, managing hospital pharmacy and its importance.
2. **Scope & Objective of the Course**: It is a course designed to give the students a flavor of pharmaceutical quality control, standard industrial guidelines, pharmaceutical process scale up and validation aspects. The course is divided into various sections for easier assimilation and the last section deals with some basic aspects of pharmaceutical management. After completing this course, students will be familiar with pharmaceutical quality control aspects, scale up and validation procedures. The relevancy of this course to routine practices followed in the pharmaceutical industry makes it attractive and important to undergraduate students who wish to pursue their career in the pharmaceutical industry.
3. **Learning outcomes:**

* The student is expected to appreciate the importance of guidelines for current good manufacturing practices within pharmaceutical manufacturing.
* The student is expected to learn how to put the cGMP guidelines into practice.
* The student is expected to learn different validation steps for various manufacturing and analytical processes.
* The student is expected to learn to use statistical tools to perform product quality analysis.
* The student is expected to learn guidelines for changes made in pharmaceutical manufacturing processes post approval for marketing.
* The student is expected to learn the principles involved in scale-up operations for preparation of pharmaceuticals.
* The student is expected to learn the basics of marketing, production, and financial management within the context of pharmaceutical industry.

1. **Text Books**:
2. Industrial Engineering and Management by Khanna O.P.; Dhanpat Rai Publication, Rev. Ed., 1999

ii. Good Manufacturing Practices for Pharmaceutical: A Plan for Total Quality

Control from Manufacturer to Consumer by Sidney H. Willing; Marcel Dekker,

5th Edition, 2001

1. **Reference Book**s:
2. Lachmann, Liebermann & Kanig: The Theory & Practice of Industrial, Pharmacy, K.M. Varghese, Third Edition, 1990. New Delhi.
3. Sekhar Mukhopadhyay: Pharmaceutical Selling, Sterling Publishers.
4. Bernard. T. Loftus, Robert A. Nash: Pharmaceutical Process Validation, Marcel Dekker.
5. Good Manufacturing Practices for Pharmaceuticals; Edited by : Joseph D.

Nally; 6th Edition; Marcel Dekker, 2007

1. Pharmaceutical Process Scale-up; Edited by: Michael Levin; Marcel Dekker, 2002

**4. Course Plan**:

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| --- | --- | --- | --- |
| Lecture No | Learning objective | Topics to be covered | **Reference Chapter/Section** |
| **Section 1: Pharmaceutical Quality Control** | | | |
| 1 | Scope & objective of course | Introduction | Class lecture |
| 2-12 | cGMP guidelines in pharmaceutical manufacturing processes | Importance of cGMP,  General guidelines (Subpart A to Subpart K) | 2(ii) Chapters 1-12  3(v) Chapters 1-12 |
| **Section 2: Pharmaceutical Process Validation** | | | |
| 13-17 | Process validation | Introduction and Types (Prospective, Retrospective & Concurrent validation) | 3(iv) Chapters 1-3 |
| 18-21 | Statistical analysis for decision making | Statistical applications in validation and QC | 3(i) Section II – Chapter 10 & Section IV - Chapter 27 |
| **Section 3: Pharmaceutical Process Scale up** | | | |
| 22-24 | Pharmaceutical Process scale up | Requirements of pilot plant for scale up operations | 3(i) Section IV – Chapter 23 |
| 25-29 | Scale-Up of tablet and parenteral dosage forms | Requirements for scale-up | 3(vi) Chapter 8 (1,2,3)  3(vi) Chapter 2 |
| 30-32 | SUPAC Guidelines | Essentials of guidelines for IR, MR, ER & Semisolid products | 3(vi) Appendix: Guidance for the Industry (Pg No. 353-499) |
| **Section 4: Pharmaceutical Marketing and Management** | | | |
| 33-35 | Basics of Pharmaceutical Marketing Management | Knowledge & functions of Marketing Management | Class Notes |
| 36, 37 | Pharmaceutical Detailing | Various aspects of Pharmaceutical selling | 3(iii) Chapter 4-7 |
| 38, 39 | Basics of Financial Management | Balance Sheet, Profit and Loss account, Fund Flow | 2 (i) Chapter 26, Section 26.1 to 26.49 |
| 40, 41 | Basics of Production Management | Supply Chain Management, Production Management | Introduction to Production and Operations management (Class Notes)  3 (i) Section IV – Chapter 25 |

**5. Evaluation scheme**:

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| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Weightage (%)** | **Date & Time** | **Remarks** |
| Mid-semester test | 90 min | 35 |  | Closed book |
| Seminar(s) / Assignment(s) |  | 25 |  | Open book |
| Comprehensive Exam | 180 min | 40 | 10/05/2023 | Open book (20%) + Closed book (20%) |

**6. Mid-semester evaluation:** To be done after the midsemester test.

**7. Grading procedure**:

1. Relative grading procedure will be followed.

2. It is not mandatory to award all the grades (i.e from A to E). Subjective judgment would be used in the award of A and E grades. Fine grading system (i.e. A, A-….) will be followed.

**8. Make-up policy:**

The facility of make-up test is meant to take care of ‘Unavoidable’ absence from scheduled tests. The instructor will decide whether a student should be considered for make up or not. No make-up will be given to surprise quizzes, seminars/assignments under whatsoever circumstances.

**9. Chamber consultation hour**: Wednesday 4-5 PM

**10. Notices**: Notices, if any, concerning the course will be displayed on the notice board of Pharmacy and/ or course management system.

**Instructor In-Charge**

**PHA F413**